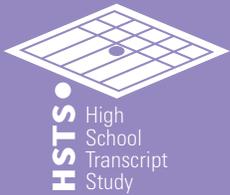


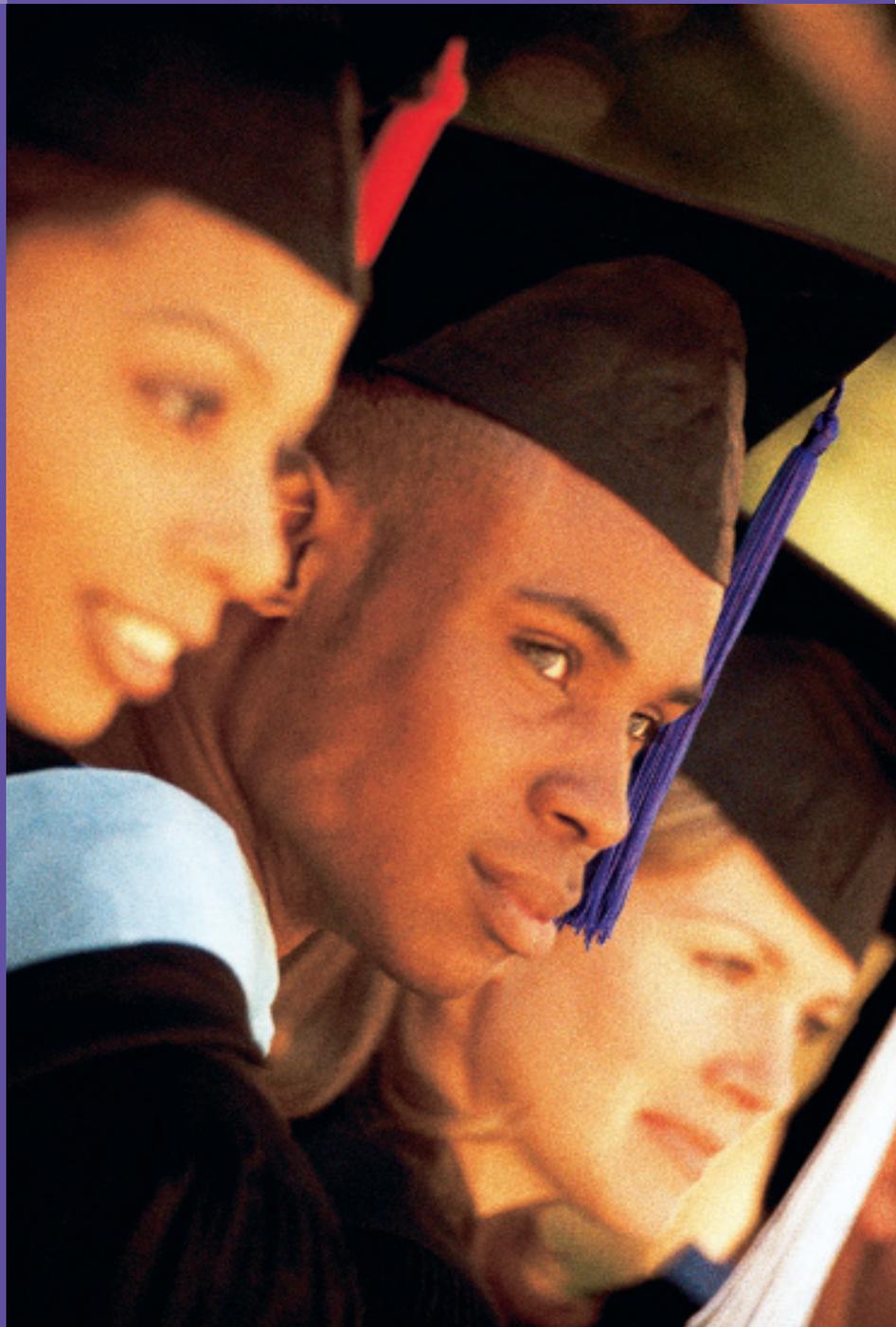
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NCES 2004-455

The High School Transcript Study

A Decade of Change in Curricula and Achievement, 1990-2000



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The High School Transcript Study



A Decade of Change in Curricula and Achievement, 1990-2000

March 2004

U.S. Department of Education
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FOREWORD

The 2000 High School Transcript Study (HSTS) was conducted by Westat for the U.S. Department of Education's National Center for Education Statistics. This study provides the Department of Education and other educational policymakers with information regarding current course offerings and students' coursetaking patterns in the nation's secondary schools. Since similar studies were conducted on the coursetaking patterns of 1982, 1987, 1990, 1994, and 1998 graduates, one research objective was to study changes in these patterns. Another research objective was to compare coursetaking patterns to study results on the 2000 National Assessment of Educational Progress (NAEP). NAEP is a federally funded, ongoing, periodic assessment of educational achievement in the various subject areas and disciplines taught in the nation's schools. Since 1969, NAEP has gathered nationwide information about the levels of educational achievement of elementary and secondary school students.

The 2000 High School Transcript Study is documented in three reports:

- *The High School Transcript Study: A Decade of Change in Curricula and Achievement, 1990–2000* – This summary report highlights major findings from the HSTS 2000 and examines the trends and changes in high school curriculum and student coursetaking patterns for the decade between 1990 and 2000.
- *The 2000 High School Transcript Study User's Guide and Technical Report* – The User's Guide and Technical Report documents the procedures used to collect and summarize the data. It also provides information needed to use all publicly released data files produced by the study.
- *The 2000 High School Transcript Study Tabulations: Comparative Data on Credits Earned and Demographics for 2000, 1998, 1994, 1990, 1987, and 1982 High School Graduates* – The Tabulations Report provides a large number of tables that summarize the coursetaking patterns of 2000 high school graduates and compare them to those of their counterparts in 1982, 1987, 1990, 1994, and 1998. The report also provides data tables describing the relationship of the coursetaking patterns of 2000 graduates to their proficiencies in mathematics and science as measured by the 2000 National Assessment of Educational Progress.

It is expected that there will be a diverse audience interested in the potential of HSTS data for educational research. The summary report will introduce researchers to the HSTS data, as well as provide highlights from the HSTS 2000 data. Some readers will be interested in a more in-depth discussion of the technical aspects of the HSTS, while other readers may wish to obtain further information on the HSTS findings. These readers are referred to the User's Guide and Technical Report and the Tabulations Report, respectively, to locate such information.

EXECUTIVE SUMMARY

Background

Over the years, various reform efforts have sought to improve the quality of education across the nation. In the early 1980s, the focus was on statewide curricula in core courses, a response to the report *A Nation at Risk* (National Commission on Excellence in Education 1983). Since then, to address issues of a quality education, efforts have emphasized courses in specific subject areas (mathematics and science, for example), the number of courses completed, and the timeline for course completion.

Transcript studies serve as a barometer for changes in high school student coursetaking patterns which, in combination with school course offerings, provide valuable information about the rigor of high school curricula across the nation. One such transcript study, the High School Transcript Study (HSTS), periodically surveys the curricula being offered in our nation's high schools and the coursetaking patterns of high school students.

This report presents findings from the HSTS 2000 and examines the trends and changes in high school curriculum and student coursetaking patterns for the past decade. The results from the HSTS 2000 are presented with respect to earned course credits, grade point average, and education achievement, as measured by the NAEP 2000 mathematics and science assessments.¹ In addition, results are compared across the transcript studies between 1990 and 2000 (HSTS 1990, HSTS 1994, HSTS 1998, and HSTS 2000). Findings are viewed throughout the report by selected student and school characteristics, including student gender, student race/ethnicity, school type (public vs. nonpublic), and region of the country.

Additional transcript studies were conducted by the National Center for Education Statistics (NCES) in 1982 in conjunction with the first follow-up survey of the High School and Beyond Study, in 1987 as a study of the 11th-grade cohort of the 1986 NAEP, and in 1992 in conjunction with the second follow-up of the National Education Longitudinal Study of 1988 (NELS:88). For documentation about these studies, see chapter 6 (References). This report looks at the HSTS from 1990 to 2000 conducted in conjunction with NAEP. For this report, only the NAEP-based transcript studies are used, because it is only for these studies that the target population remains the same.

¹For HSTS 2000, NCES conducted a national survey of high school transcripts of 12th-grade students in conjunction with the 2000 National Assessment of Educational Progress (NAEP) mathematics and science assessments. The irregular frequency of the HSTS transcript studies prevents the comparisons of HSTS data with the NAEP main mathematics and science assessments from previous years. The NAEP main assessments associated with HSTS 1994 and HSTS 1998 covered neither mathematics nor science. A NAEP main mathematics assessment occurred in 1990, but the design of HSTS 1990 linked HSTS with NAEP data at the school level, not at the student level.

It should also be noted that trends in the relationship between coursetaking patterns and student achievement (as measured by NAEP) are not presented, since the corresponding NAEP assessment subjects differ across years. However, comparisons of coursetaking patterns are possible, due to the comparable analysis and course classification methodologies across the HSTS. The 2000 transcript study was conducted from May through October of 2000 after the administration of NAEP. Transcripts were collected for 12th-grade students who graduated high school by the end of the collection period. Most students also participated in the NAEP assessments earlier that same year.

The differences between the estimates discussed in the report take into account the standard errors associated with the estimates. Comparisons are based on statistical tests that consider both the magnitude of the difference between the estimates and the standard errors of those statistics. The statistical tests used in the analysis included Bonferroni-adjusted t-tests and correlations (see appendix A for further detail). Throughout this report, differences between estimates are pointed out only when they are significant from a statistical perspective. All differences reported are significant at the 0.05 alpha level.

Key Findings

Course Credits Earned

- Overall, the number of course credits² earned by high school graduates increased throughout the 1990s. In 2000, high school graduates earned an average of 26.2 course credits, compared to an average of 23.6 in 1990 (see figure 1 in chapter 2).
- The average number of credits earned in the core academic subject fields (mathematics, science, English, and social studies) increased from 13.7 to 15.0 credits between 1990 and 2000 (see figure 3 in chapter 2).
- High school graduates increased their number of earned credits in computer-related vocational courses from 0.4 in 1990 to 0.7 in 2000 (see figure 4 in chapter 2). In the same 10-year span, the number of credits earned by high school graduates decreased in noncomputer-related vocational courses (3.5 in 1990, 3.1 in 2000).
- Public high school graduates increased their number of earned course credits from 1990 (23.5) to 2000 (26.2) (see figure 8 in chapter 2).

²Schools participating in the HSTS varied widely in their assignments of credits to their courses. The transcript study standardized the credits across schools such that one credit equals one Carnegie unit. One Carnegie unit equals a class period (45 to 60 minutes) that occurs once per day across the entire school year. Standardization to Carnegie units allows for an accurate comparison of course credits across schools within a transcript study and also allows for an accurate comparison between transcript studies over time.

Grade Point Average

- From 1990 to 2000, the grade point average³ (GPA) of high school graduates increased from 2.68 to 2.94 (with a highest possible GPA of 4.00) (see figure 10 in chapter 3).
- Of the 16 major course subjects covered by the HSTS 2000, mathematics and science courses proved the most difficult for high school students. High school graduates in the year 2000 earned 2.60 and 2.67 mean GPAs, respectively, for mathematics and science courses (see table 3 in chapter 3), both lower than the mean GPAs for the other 14 course subjects. High school graduates also earned lower mathematics and science mean GPAs compared to other course subjects in the 1990, 1994, and 1998 transcript studies.
- In 2000, high school graduates who took Advanced Placement (AP) and/or International Baccalaureate (IB) courses in both mathematics and science earned an overall mean GPA of 3.61. This mean GPA was higher than graduates who took AP/IB mathematics courses only (3.53 GPA) or AP/IB science courses only (3.33 GPA) (see table 4 in chapter 3).⁴ High school graduates who took neither AP/IB mathematics courses nor AP/IB science courses earned a lower overall mean GPA (2.85) than the AP/IB coursetaking subgroups.
- High school graduates in 2000 earned a higher mean GPA during grade 12 than in any other grade. The 2000 high school graduates earned a 12th-grade mean GPA of 3.03, compared to a 2.92 mean GPA for 9th grade, a 2.89 mean GPA for 10th grade, and a 2.92 mean GPA for 11th grade (see figure 12 in chapter 3).
- Female high school graduates earned a higher overall mean GPA in 2000 than male high school graduates (3.05 vs. 2.83) (see figure 13 in chapter 3).
- The increase in the mean GPA of high school graduates from 1990 to 2000 was evident for all examined student and school characteristics (gender, race/ethnicity, school type, and region of the country).

Education Achievement

- Public and nonpublic high school graduates differed in their mean NAEP 2000 mathematics assessment scores.⁵ Nonpublic high school graduates achieved a mean

³The grade point average represents the average number of grade points a student earns for each graded high school course. Since not all schools have the same standards for course credits and grade scales, the HSTS converts course credits to standardized Carnegie units and assigns grade points based on the four-point grade scale. There were no additional grade points assigned for Advanced Placement, International Baccalaureate, and other honors classes.

⁴Advanced Placement and International Baccalaureate mathematics courses include courses in precalculus, calculus, and statistics. Advanced Placement and International Baccalaureate science courses include courses in biology, chemistry, physics, and environmental science.

⁵Public schools include all state-run elementary, secondary, charter, Bureau of Indian Affairs, and Department of Defense schools. Nonpublic schools include Catholic schools, other religious schools, and all other private schools.

318 mathematics assessment score (out of a possible 500 points), compared to the mean 300 mathematics assessment score achieved by public high school graduates (see table 7 in chapter 4).

- Those HSTS 2000 graduates with AP/IB mathematics credits achieved a mean 345 NAEP mathematics assessment score (out of a possible 500 points), compared to the mean 297 mathematics assessment score achieved by graduates without AP/IB mathematics credits (see table 7 in chapter 4). Graduates with AP/IB science credits had a mean 179 NAEP science assessment score (out of a possible 300 points), compared to the mean 144 science assessment score achieved by graduates without AP/IB science credits (see table 8 in chapter 4).
- High school graduates in the HSTS 2000 who earned mathematics course credits during the 12th grade earned higher scores on the NAEP 2000 mathematics assessment than graduates who last earned mathematics course credits before the 12th grade (see table 7 in chapter 4).
- The NAEP 2000 science assessment scores earned by graduates differed by the highest science course level attained—the higher the science course level graduates attained, the higher the mean NAEP science assessment score they achieved (see table 8 in chapter 4).
- A large positive correlation existed between the GPA that 2000 high school graduates earned in mathematics courses and their NAEP mathematics assessment scores (see table 7 in chapter 4).⁶ A medium positive correlation existed between their GPA in science courses and their NAEP science assessment scores (see table 8 in chapter 4).

⁶See chapter 4 and appendix A for a description of correlation values.

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1. INTRODUCTION

Over the years, various reform efforts have changed the direction or emphasis of education, but the goal has remained the same—to provide a quality education to students. In the early 1980s, attention turned to statewide curricula. With the publication of *A Nation at Risk* (National Commission on Excellence in Education 1983), core curricula were established that were intended to ensure student preparedness for college entrance and global competitiveness in technology. Around the same time, the National Center for Education Statistics (NCES) was developing plans for its first transcript study, which was conducted in 1982 and has been conducted periodically ever since, in order to survey the coursetaking patterns of high school students across the nation. This report presents findings from the 2000 High School Transcript Study (HSTS 2000) and examines the trends and changes in high school curriculum and student coursetaking patterns for the past decade from 1990 to 2000.

Overview of the High School Transcript Study

The High School Transcript Study (HSTS) gathers information from the transcripts of 12th-grade students in public and nonpublic high schools nationwide.⁷ The information gathered is used to inform the education community on current course offerings and coursetaking patterns in the nation's secondary schools. Also, the HSTS transcript studies, most of which were conducted with the National Assessment of Educational Progress (NAEP), allow the relationship between coursetaking patterns and student achievement to be explored.⁸ This report focuses on highlights from the HSTS 2000 study. These highlights include course credits earned, grade point average, and NAEP assessment scores. This report also looks at changes that have occurred in course credits earned and grade point average for high school graduates listed in the HSTS studies from 1990 to 2000.

Additional transcript studies were conducted by NCES in 1982 in conjunction with the first follow-up survey of the High School and Beyond Study, in 1987 as a study of the 11th-grade cohort of the 1986 NAEP, and in 1992 in conjunction with the second follow-up of the National Education Longitudinal Study of 1988 (NELS:88). For documentation about these studies, see chapter 6 (References). This report looks at the HSTS from 1990 to 2000 conducted in conjunction with NAEP. For

⁷Public schools include all state-run elementary, secondary, charter, Bureau of Indian Affairs, and Department of Defense schools. Nonpublic schools include Catholic schools, other religious schools, and all other private schools.

⁸The purpose of NAEP is to measure student achievement in the context of instructional experiences and to track change in achievement of 4th-, 8th-, and 12th-graders over time in selected content domains.

this report, only the NAEP-based transcript studies are used, because it is only across all of these studies that the target population remains the same.

The High School Transcript Study Framework: The Classification of Secondary School Courses

High school courses across the country vary by content and level even when the course title is similar. Therefore, to compare transcripts from different schools and to ensure that each course is uniquely identified, a common course coding system, the Classification of Secondary School Courses (CSSC), was employed. The CSSC is a modification of the Classification of Instructional Programs (CIP) that is used for classifying college courses. Each course that appears on a student transcript is assigned a unique six-digit code based on the course content and level. Course catalogs and other materials from the participating schools are used to determine the content and level of courses at each school.

For analysis and data presentation purposes, the CSSC is used to aggregate courses into more general categories, such as English, mathematics, and science. More detailed categories are used, for example, to report findings on such courses as Composition, General Mathematics, and Advanced Placement (AP) Chemistry. All of the courses in each of the transcript studies were coded using the CSSC. Therefore, the coursetaking patterns of the 1990, 1994, 1998, and 2000 high school graduates can be compared across years.

High School Transcript Study Instruments

The HSTS collects authentic transcripts of students graduating in the year of the study. In addition to the course name, grade, and credit received, student information such as gender, grade level, age, graduation status, race/ethnicity, grade point average, and class rank are also collected, when available. Additional information for students with disabilities (SD) and limited English proficient (LEP) students was collected.

To provide a context for the transcript data collected, information was also collected about school, teacher, and home factors that may be related to student course taking and achievement via the NAEP School Questionnaire. As part of the NAEP data collection, a school official, usually the principal, completes the School Questionnaire. A School Information Form (SIF) is also completed for each participating school, by the data collections field staff or a school staff member. The SIF is used to gather information about the general school characteristics, sources of information within the school, the course

description materials, school graduation requirements and grading practices, and the format of the school's transcripts. This information is valuable during the data entry and coding phases of the Transcript Study.

NCES makes a concerted effort to collect information on students with special needs in all of their studies. Beginning in 1996, as a part of the NAEP assessments, information is collected from school staff about students with disabilities and limited English proficient students via the NAEP SD/LEP Questionnaire. The SD/LEP Questionnaire is completed for students sampled for NAEP and identified by the school as having a disability and/or as limited English proficient. For students who are not sampled for the NAEP assessments, this information is collected from the student transcript.

Description of the Samples

The HSTS 2000 was conducted with a nationally representative sample of 20,931 high school graduates from 277 schools (both public and nonpublic). Twelfth-grade students, whose transcript indicated that they graduated between January 1, 2000, and October 31, 2000, the final date of data collection, were included in the study. Approximately 96 percent of sampled students in the HSTS 2000 transcript study were enrolled in schools that participated in the NAEP assessments. The remaining 4 percent were enrolled in schools that were sampled for NAEP but declined to participate. These schools, however, did participate in the HSTS. The school response rate for the HSTS 2000 was 80.8 percent, while the student response rate was 98.9 percent.

The 1998 HSTS had a nationally representative sample of 24,904 high school graduates from 264 schools. The school response rate for the HSTS 1998 was 81.5 percent, with a student response rate of 98.6 percent. The 1994 HSTS had a nationally representative sample of 25,364 graduates from 340 schools. The school response rate for the HSTS 1994 was 89.7 percent, with a student response rate of 99.5 percent. The 1990 HSTS had a nationally representative sample of 21,435 graduates from 330 schools. The school response rate for the HSTS 1990 was 87.1 percent, with a student response rate of 99.6 percent.

The 1990, 1994, 1998, and 2000 High School Transcript Studies have similar features with respect to sampling, including complex sample design, sample sizes, and weighting techniques. For detailed information, see *The 2000 High School Transcript Study User's Guide and Technical Report* (U.S. Department of Education 2004b).

Target Population

The target populations for all analyses in this report were high school graduates for each HSTS year (1990, 1994, 1998, and 2000). To assure that the analyses included just high school graduates, only student transcripts that indicated that a regular/standard or honors diploma was obtained were included. In addition, only students with 16 or more earned course credits (Carnegie units⁹) and a positive number of English course credits were included. Transcripts that did not include detailed course data for at least three full years of high school and those indicating that a special education diploma or a certificate of attendance was obtained were excluded from the reported findings. For HSTS 2000, these inclusion criteria resulted in 20,272 student transcripts, which represented a weighted total of 2,961,741 high school graduates.

Reporting Results

The results from the HSTS 2000 are presented with respect to coursetaking patterns, grade point average, and the relationship between course taking and grade point average to student achievement in the NAEP 2000. In addition, results are compared across the transcript studies between 1990 and 2000 (HSTS 1990, HSTS 1994, HSTS 1998, and HSTS 2000). Findings are viewed throughout the report by selected student and school characteristics, including gender, race/ethnicity,¹⁰ school type (public vs. nonpublic), and region.

The irregular frequency of the HSTS transcript studies prevents the comparisons of HSTS data with the NAEP national main mathematics and science assessments from previous years. The NAEP national main assessments associated with HSTS 1994 and HSTS 1998 covered neither mathematics nor science. A NAEP national main mathematics assessment occurred in 1990, but the design of HSTS 1990 linked HSTS with NAEP data at the school level, not at the student level. NCES also provides NAEP long-term trend assessments in mathematics and science as measures of educational progress over time. The HSTS works in association with the NAEP main assessments, however, and results from the main assessments and trend assessments are not comparable. More information about the NAEP long-term trend assessments can be found in *NAEP 1999 Trends in Academic Progress: Three Decades of Student*

⁹One Carnegie unit equals a class period (45 to 60 minutes) that occurs once per day across the entire school year. Standardization to Carnegie units allows for a valid comparison of course credits across schools within a transcript study, and for a reliable comparison between transcript studies over time.

¹⁰The HSTS defines a student's race/ethnicity as "White," "Black," "Hispanic," "Asian/Pacific Islander," "Native American," "Other race," or "Not reported." The terms "White" and "Black" are abbreviated labels for "White, non-Hispanic" and "Black, non-Hispanic," respectively.

Performance (U.S. Department of Education 2000). For this report, the term “assessment scores” refers to scores from the NAEP national main assessments.

The NAEP assessment results presented in this report reflect the findings from those HSTS 2000 students that met the criteria for analyses. These criteria included a standard or honors diploma, at least 16 earned course credits, and a positive number of earned English course credits. These results do not reflect the NAEP sample as a whole.

Caution in Interpreting Results

The results pertaining to course credits earned and grade point average presented in this report are estimates because they are based on samples of students rather than on entire populations. Likewise, the NAEP average scores are also estimates of student performance. In addition, the results are subject to a measure of uncertainty due to sampling and measurement error. These measures of uncertainty are reflected in the standard error of the estimates. The standard errors for the estimates in this report are provided in appendix C.

The differences between the estimates discussed in the following chapters take into account the standard errors associated with the estimates. Comparisons are based on statistical tests that consider both the magnitude of the difference between the estimates and the standard errors of those statistics. Throughout this report, differences between estimates are pointed out only when they are significant from a statistical perspective. All differences reported are significant at the 0.05 alpha level. The term significant is not intended to imply a judgment about the absolute magnitude or the educational relevance of the differences, but rather to identify statistically dependable population differences to help inform dialogue among policymakers, educators, and the public.

Readers are cautioned against interpreting transcript study results in a causal manner. Inferences related to student subgroup performance or to the effectiveness of public and nonpublic schools, for example, should take into consideration the many socioeconomic and educational factors that may also affect coursetaking patterns and academic performance. An increase or decrease in overall GPA may result from a number of factors. The change could reflect either the growth or decline of high school graduates’ academic achievement. It could also reflect changes in teachers’ standards for grading, changes in material taught for courses, or other factors that cannot be measured by the HSTS.

Structure of the Report

The results from the HSTS 2000, as well as the HSTS 1990, HSTS 1994, and HSTS 1998, are presented in the following chapters. Chapter 2 of this report details the coursetaking patterns of high school graduates. Chapter 3 presents findings related to grade point average, and chapter 4 details the relationship between course taking, grade point average, and achievement, as measured by average NAEP scale scores. Chapters 2 and 3 detail trends from 1990 to 2000, while chapter 4 concentrates solely on the 2000 transcript data. Chapter 5 provides a summary and conclusions, and chapter 6 lists the references for the report.

This report also contains appendixes that support or augment the results presented. Appendix A describes the study methodology. Appendix B presents many of the findings from figures within the body of the report in tabular form, and appendix C includes standard error tables for the data presented in the report. Appendix D contains a glossary of terms.

2. COURSE CREDITS EARNED

Course credits provide a relevant measure of high school coursetaking patterns. Examining the number of course credits high school graduates earned, and in what course subjects graduates earned them, sheds light on the content of their high school education. Are high school students taking more or fewer courses? Are high school students earning more or fewer credits in the core course subjects, such as mathematics and science? What vocational course subjects, if any, are high school students taking for their electives? An analysis of earned course credits taken from high school transcripts can answer these questions.

This chapter discusses trends in earned course credits from 1990 to 2000. Data for this chapter comes from analyses of the 1990, 1994, 1998, and 2000 High School Transcript Studies (HSTS). Each section in the chapter highlights HSTS 2000 results and compares these results with results from the previous transcript studies. Unless otherwise noted, only statistically significant findings are discussed. Figures and tables present the mean number of course credits earned, either by all high school graduates or by subgroups of selected student and school characteristics. The student characteristics include gender and race/ethnicity, and the school-based characteristics include school type (public or nonpublic school) and region of the country.¹¹

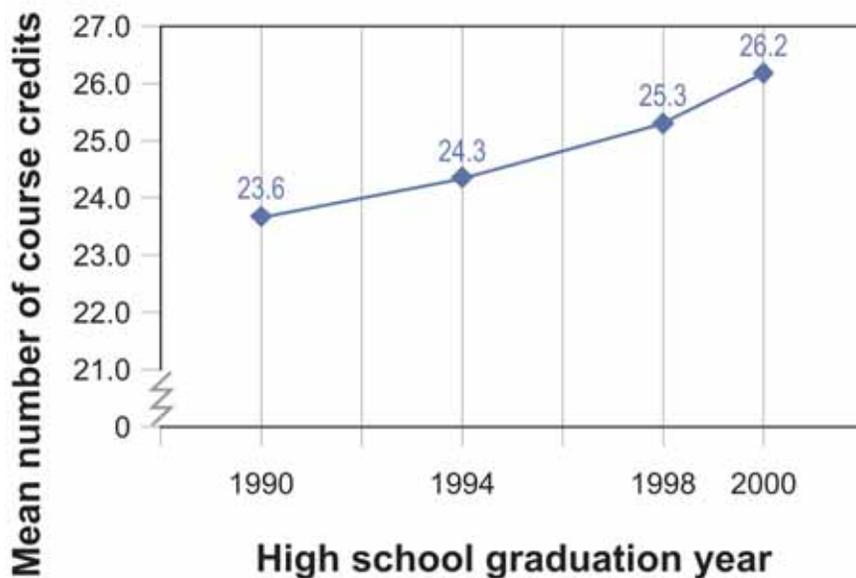
Schools participating in the HSTS varied widely in their assignments of credits to their courses. The transcript study standardized the credits across schools such that one credit equals one Carnegie unit. One Carnegie unit equals a class period (45 to 60 minutes) that occurs once per day across the entire school year. Standardization to Carnegie units not only allows for a meaningful comparison of course credits across schools within a transcript study, but also allows for a meaningful comparison between transcript studies over time. In this report, “course credits” refer to the standardized Carnegie units, not the credits as reported on the transcripts.

Total Course Credits Earned

Figure 1 shows the mean number of course credits earned by high school graduates for the years 1990, 1994, 1998, and 2000.

¹¹In this report, public schools include all state-run elementary, secondary, charter, Bureau of Indian Affairs, and Department of Defense schools. Nonpublic schools include Catholic schools, other religious schools, and all other private schools. The term “region of the country” refers to the Census-defined geographic regions: Northeast, South, Midwest, and West. See appendix A for more information.

Figure 1. Mean course credits earned by high school graduates: 1990, 1994, 1998, and 2000



NOTE: "Course credits" refer to standardized Carnegie units.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

The graduates' mean course credits increased over the 10-year period from 1990 to 2000. In 2000, high school graduates earned an average of 26.2 course credits. In 1990, high school graduates earned an average of 23.6 course credits. An increase in earned mean course credits occurred for each transcript study from 1990 to 2000. Between 1998 and 2000, for example, the mean course credits increased by nine-tenths of one credit, from 25.3 course credits to 26.2 course credits.

Course Credits Earned in Course Subjects

This section presents the mean number of course credits earned by high school graduates as defined by the 16 course subjects outlined in the Secondary School Taxonomy (SST).¹² It focuses on various groups of course subjects, including core courses, non-core courses, and vocational courses, as well as subgroups of the course subjects, including Advanced Placement (AP) and International Baccalaureate (IB) courses. For additional data on individual course subjects, which includes detailed

¹²The 16 Secondary School Taxonomy course subjects are as follows: Mathematics, Science, English, Social Studies, Fine Arts, Foreign Languages, Computer-Related Studies, Consumer and Homemaking Education, General Labor Market Preparation, Specific Labor Market Preparation, General Skills, Personal Health and Physical Education, Religion, Military Science, Special Education, and All Other Courses.

cross-tabulations by student gender, student race/ethnicity, school type, and region of the country, see *The 2000 High School Transcript Study Tabulations* (U.S. Department of Education 2004a).

Course Credits Earned in Core Course Subjects. Figure 2 shows the mean number of course credits earned by high school graduates, by the core academic subjects (mathematics, science, English, and social studies), for the years 1990, 1994, 1998, and 2000.

High school graduates in the year 2000 earned more course credits in English than in any other core academic subject. In 2000, high school graduates earned a mean 4.3 English course credits, compared with a mean 3.9 social studies course credits, a mean 3.7 mathematics course credits, and a mean 3.2 science course credits. Graduates in the 1990, 1994, and 1998 transcript studies also earned more course credits in English than in the other core academic subjects.

Compared to 1990, the 2000 high school graduates earned more course credits in all four core academic subjects. High school graduates' mathematics course loads increased from a mean 3.2 credits in 1990 to a mean 3.7 credits in 2000, and their science course loads increased from a mean 2.8 credits in 1990 to 3.2 credits in 2000. Over the same 10-year period, high school graduates' social studies course loads increased from 3.5 credits to 3.9 credits, and their English course loads increased from 4.1 credits to 4.3 credits.

Changes in the mean course credits earned in the core academic subjects may partially arise from changes in the states' course credit requirements for high school graduation. The Council of Chief State School Officers (CCSSO) reported that many states raised their graduation requirements for English, mathematics, science, and social studies courses from 1987 to 2000.¹³ Table 1 summarizes their core academic course findings.

Table 1. State-level course credit graduation requirements: 1987 and 2000

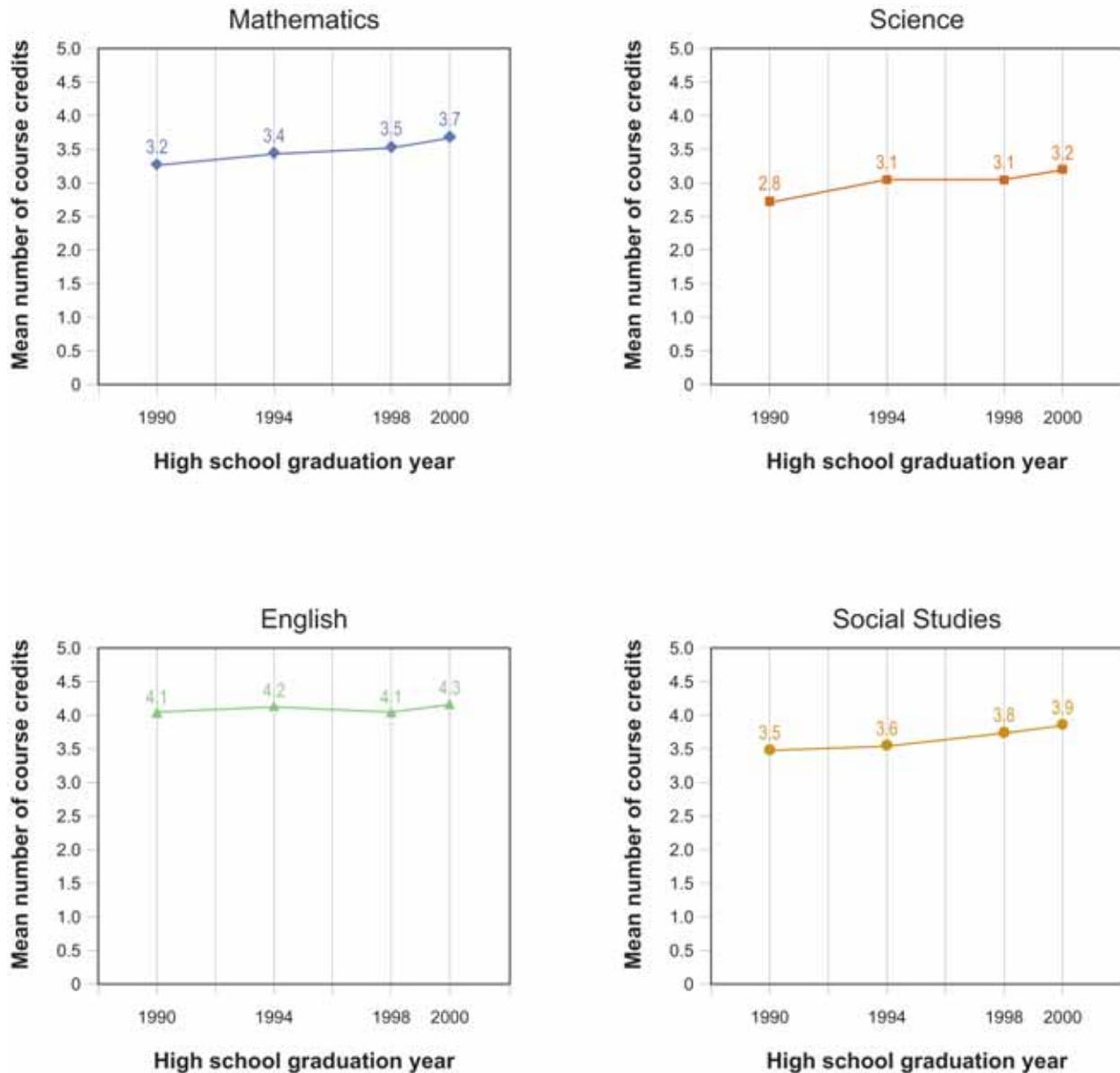
High school graduation requirement	Number of states with graduation requirement	
	1987	2000
4 or more English Carnegie units.....	35	36
2.5 or more mathematics Carnegie units.....	12	25
2.5 or more science Carnegie units	6	20
2.5 or more social studies Carnegie units	25	35

NOTE: Vermont required a combined total of five Carnegie units for mathematics and science courses for graduation in the year 2000. For purposes of this table, the five Carnegie units were split equally (2.5 Carnegie units) among mathematics and science courses.

SOURCE: Council of Chief State School Officers, *Key State Education Policies on K-12 Education: 2000*.

¹³The CCSSO series of publications that discuss state education policies for elementary and secondary schools did not report state-level graduation requirements for 1990.

Figure 2. Mean course credits earned by high school graduates, by core academic subject: 1990, 1994, 1998, and 2000



NOTE: "Course credits" refer to standardized Carnegie units.

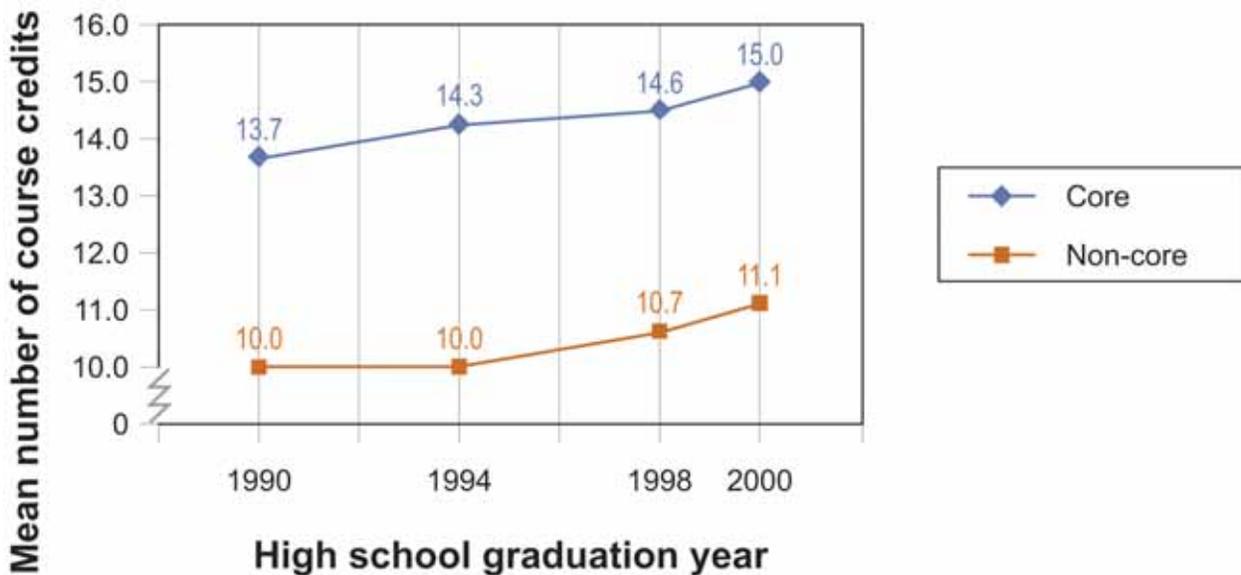
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

The double-digit increases in the number of states requiring 2.5 or more mathematics, science, and social studies credits shown in table 1 help explain the rise in the mean course credits for

those subjects. As for English credits, the number of states requiring four Carnegie units of English for graduation rose by one (35 states in 1987, 36 states in 2000).

Figure 3 compares the mean number of core and non-core course credits earned by high school graduates for the years 1990, 1994, 1998, and 2000. Core credits represent academic course credits earned in mathematics, science, English, and social studies courses.¹⁴ Non-core credits represent course credits earned in all course subjects other than the four core academic subjects.¹⁵

Figure 3. Mean core and non-core course credits earned by high school graduates: 1990, 1994, 1998, and 2000



NOTE: "Course credits" refer to standardized Carnegie units. Core courses represent all courses in mathematics, science, English, and social studies. Non-core courses represent all other courses not defined as core courses.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

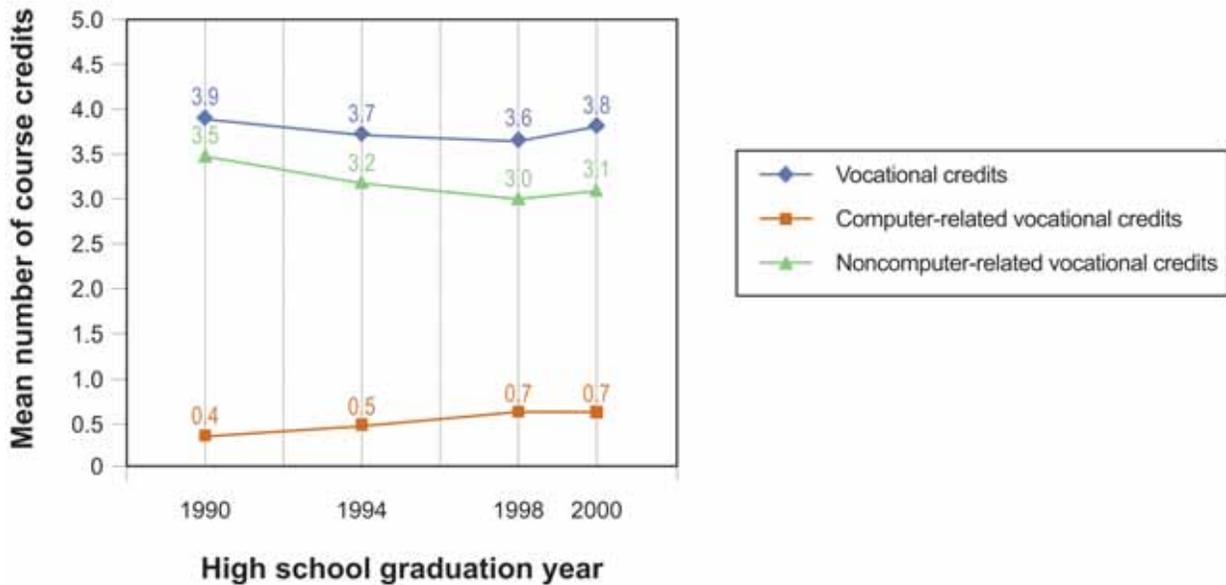
¹⁴The HSTS defines "core courses" as those course subjects that high school graduates need to take to earn a standard diploma. The state graduation requirements reported by the Council of Chief Secondary School Officers (CCSSO) were used to set its definition. These "core courses" traditionally consist of English, social studies, mathematics, and science courses. In 2000, 48 states required one or more credits in these four course subject areas for a high school student to graduate. Fewer states required fine arts credits to graduate with a standard diploma, and far fewer states required foreign languages credits (although most states did require some foreign language credits for their Honors diplomas). For this reason, neither fine arts nor foreign languages courses were grouped in the core courses category.

¹⁵Non-core credits include the following Secondary School Taxonomy course subjects: Fine Arts, Foreign Languages, Computer-Related Studies, Consumer and Homemaking Education, General Labor Market Preparation, Specific Labor Market Preparation, General Skills, Personal Health and Physical Education, Religion, Military Science, Special Education, and All Other Courses.

Gains occurred in the mean number of earned course credits for both core and non-core subjects from 1990 to 2000. The 2000 high school graduates earned a mean 15.0 course credits in the four core academic subjects, compared with the mean 13.7 course credits earned by the 1990 high school graduates. The 2000 high school graduates earned a mean 11.1 course credits in all other course subjects, compared with the mean 10.0 course credits earned by the 1990 high school graduates.

Course Credits Earned in Vocational Courses. Figure 4 shows the mean number of vocational course credits earned by all high school graduates for the years 1990, 1994, 1998, and 2000. Vocational courses encompass courses that provide students with the academic and technical knowledge and skills needed for further education and/or careers requiring less than a bachelor’s degree. At the high school level, vocational courses include courses in consumer and homemaking education, general labor market preparation, and specific labor market preparation. The figure also shows the number of computer-related (CR) and noncomputer-related (NCR) vocational course credits earned by high school graduates for the same years. Computer-related vocational courses are vocational courses associated with clerical and data entry, computer applications, and computer science. Noncomputer-related vocational courses include all other vocational courses.

Figure 4. Mean vocational credits, computer-related vocational credits, and noncomputer-related vocational credits earned by high school graduates: 1990, 1994, 1998, and 2000



NOTE: "Course credits" refer to standardized Carnegie units. Computer-related vocational courses are vocational courses associated with clerical and data entry, computer applications, and computer science. Noncomputer-related vocational courses include all other vocational courses.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

Between 1990 and 2000, high school graduates increased their number of earned credits in computer-related vocational courses. Computer-related vocational courses included keyboarding, data processing, computer programming, computer graphic arts, and desktop publishing. The 2000 high school graduates earned a mean 0.7 course credits in computer-related vocational courses, three-tenths of a credit more than the mean 0.4 course credits earned by the 1990 graduates.

In the same 10-year span, high school graduates earned fewer credits in noncomputer-related vocational courses. Noncomputer-related vocational courses included agricultural, health science, industrial arts, occupational home economics, and other trade-related courses. The 2000 high school graduates earned a mean 3.1 course credits in noncomputer-related vocational courses, compared with the mean 3.5 course credits earned by 1990 graduates.

Course Credits Earned in AP and IB Courses. Table 2 shows the percentage of high school graduates earning course credits in AP and IB mathematics courses for the years 1990, 1994, 1998, and 2000. The table also shows the percentage of high school graduates earning course credits in AP and IB science courses for the years 1998 and 2000. For the 1990 and 1994 transcript studies, the table shows only the percentage of high school graduates that took AP Calculus. Through the 1994 HSTS, nearly all AP and IB courses were grouped with honors courses, and therefore could not be distinguished in the data.

Table 2. Percentage of high school graduates earning AP and IB mathematics and science course credits: 1990, 1994, 1998, and 2000

Graduates' AP and IB course status	Percentage of graduates earning AP and IB course credits			
	1990 graduates	1994 graduates	1998 graduates	2000 graduates
AP/IB mathematics, AP/IB science	†	†	3.2	4.4
AP/IB mathematics, no AP/IB science	4.4	7.6	5.8	5.1
No AP/IB mathematics, AP/IB science	†	†	4.7	4.7
No AP/IB mathematics, no AP/IB science	95.6	92.4	86.4	85.8

† Not applicable. The HSTS did not collect separate data on AP and IB science courses until the 1998 transcript study.

NOTE: Detail may not sum to totals because of rounding. "Course credits" refer to standardized Carnegie units. AP/IB mathematics courses include courses in precalculus, calculus, and statistics. AP/IB science courses include courses in biology, chemistry, physics, and environmental science.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

A higher percentage of 2000 high school graduates earned AP and IB mathematics course credits than 1990 high school graduates. In 2000, 9.5 percent of high school graduates earned credits in AP and IB mathematics courses, compared with 4.4 percent of 1990 high school graduates. The measurement of AP/IB mathematics courses played a role in the increase. In 1990, the only AP/IB mathematics course to have its own CSSC code was AP Calculus. All other AP/IB mathematics courses

were either included with regular or honors mathematics courses. In 2000, AP and IB mathematics courses with their own CSSC codes included courses in precalculus, calculus, and statistics.

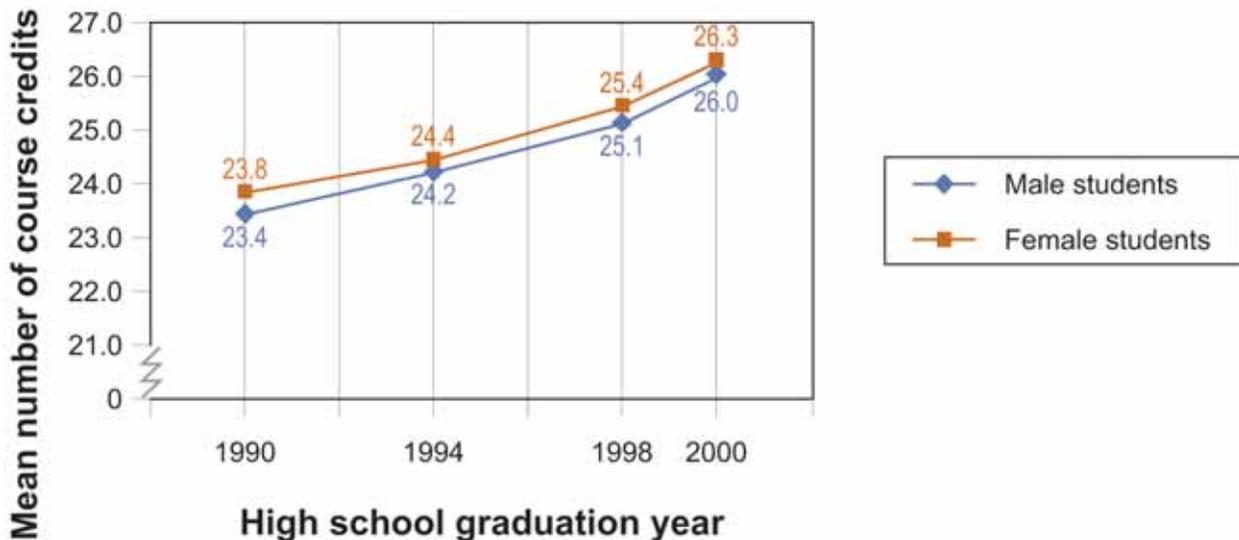
Approximately 9.1 percent of the 2000 high school graduates earned credits in AP and IB science courses. AP and IB science courses include courses in biology, chemistry, physics, and environmental science. In 1998, 7.8 percent of high school graduates earned credits in AP and IB science courses.

Total Course Credits Earned, by Student and School Characteristics

This section presents the mean number of course credits earned by high school graduates as defined by selected student and school characteristics. These characteristics include student gender, student race/ethnicity, school type (public or nonpublic school), and region of the country.

Total Course Credits Earned, by Gender. Figure 5 shows the mean number of course credits earned by high school graduates, by gender, for the years 1990, 1994, 1998, and 2000.

Figure 5. Mean course credits earned by high school graduates, by gender: 1990, 1994, 1998, and 2000



NOTE: "Course credits" refer to standardized Carnegie units.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

Both males and females increased their numbers of earned course credits from 1990 to 2000. Male graduates earned a mean of 26.0 course credits in 2000, an 11 percent increase over the 23.4 mean course credits they earned in 1990. Female graduates earned a mean of 26.3 course credits in 2000, a 10 percent gain over the 23.8 mean course credits they earned in 1990.

Figure 6 shows the mean number of core and non-core credits earned by high school graduates, by gender, for the years 1990, 1994, 1998, and 2000. Core credits represent academic course credits earned in mathematics, science, English, and social studies courses. Non-core credits represent course credits earned in all course subjects other than the four core academic subjects.¹⁶

Female high school graduates earned more core credits in 2000 than male high school graduates. In 2000, female graduates earned a mean 15.2 core course credits, while male graduates earned a mean 14.8 core course credits. The difference between females and males in earned core credits also occurred in the 1998 transcript study. In 1998, female graduates earned a mean 14.7 core course credits, while male graduates earned a mean 14.4 core course credits.

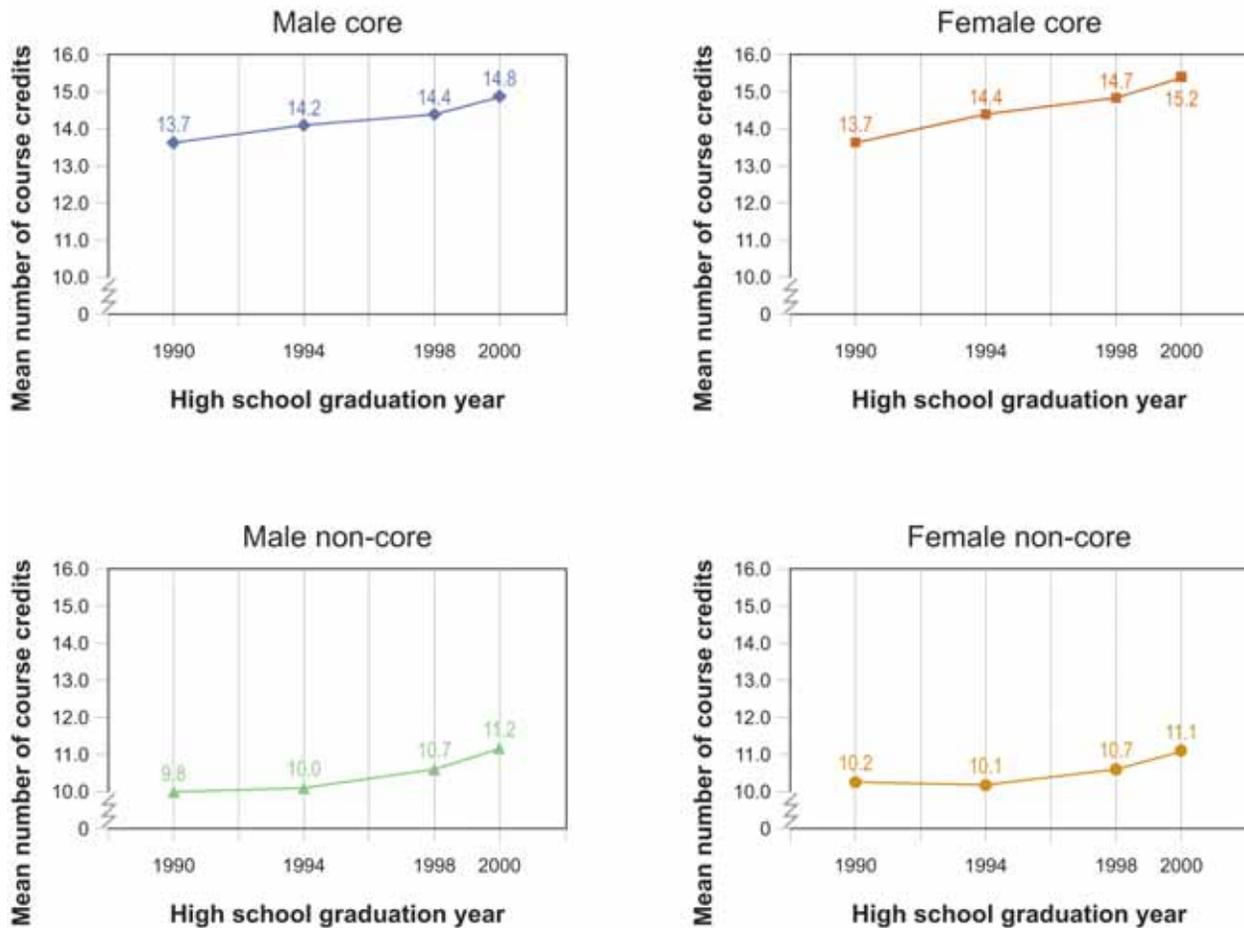
The gap between male and female graduates' earned non-core credits changed from 1990 to 2000. In 1990, female graduates earned more non-core credits (mean 10.2 credits) than male graduates (mean 9.8 credits). Male graduates' mean non-core course credits increased to 11.2 credits in 2000. Female graduates' mean non-core course credits increased to 11.1 credits in 2000.

Total Course Credits Earned, by Race/Ethnicity. Figure 7 shows the mean number of course credits earned by high school graduates, by race/ethnicity, for the years 1990, 1994, 1998, and 2000.

All four major racial/ethnic subgroups showed an increase in the mean number of course credits collected from 1990 to 2000. White high school graduates' mean course credits increased 2.6 credits from 1990 (23.7 credits) to 2000 (26.3 credits), and Black graduates' mean course credits increased 2.4 credits (from 23.5 credits in 1990 to 25.9 credits in 2000). Asian/Pacific Islander graduates' mean course credits increased from 24.2 credits in 1990 to 26.2 credits in 2000, and Hispanic graduates' mean course credits increased from 24.0 credits in 1990 to 25.7 credits in 2000.

¹⁶Non-core credits include the following Secondary School Taxonomy course subjects: Fine Arts, Foreign Languages, Computer-Related Studies, Consumer and Homemaking Education, General Labor Market Preparation, Specific Labor Market Preparation, General Skills, Personal Health and Physical Education, Religion, Military Science, Special Education, and All Other Courses.

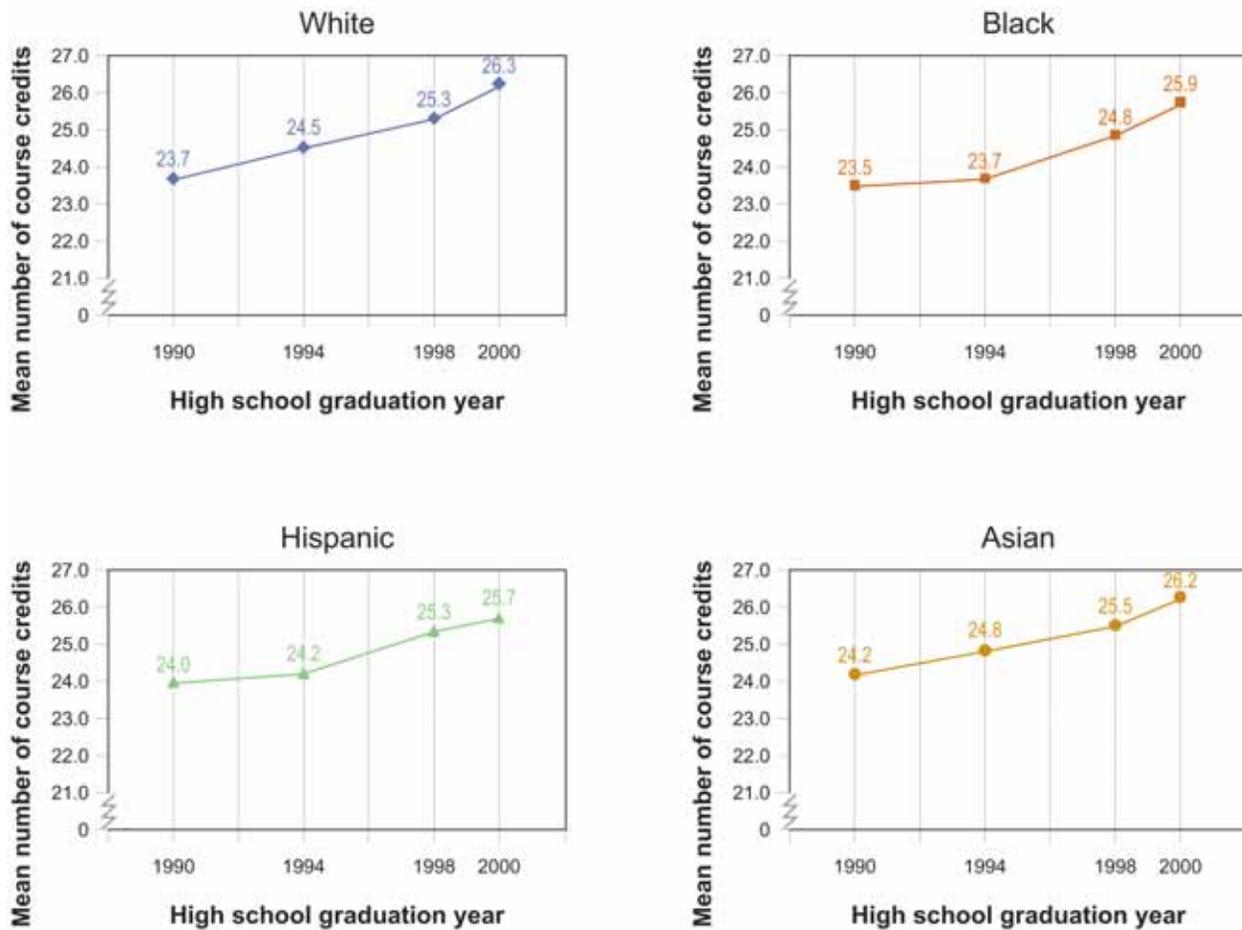
Figure 6. Mean core and non-core course credits earned by high school graduates, by gender: 1990, 1994, 1998, and 2000



NOTE: "Course credits" refer to standardized Carnegie units. Core course credits represent course credits earned in mathematics, science, English, and social studies courses. Non-core course credits represent course credits earned in all courses not defined as core courses.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

Figure 7. Mean course credits earned by high school graduates, by race/ethnicity: 1990, 1994, 1998, and 2000

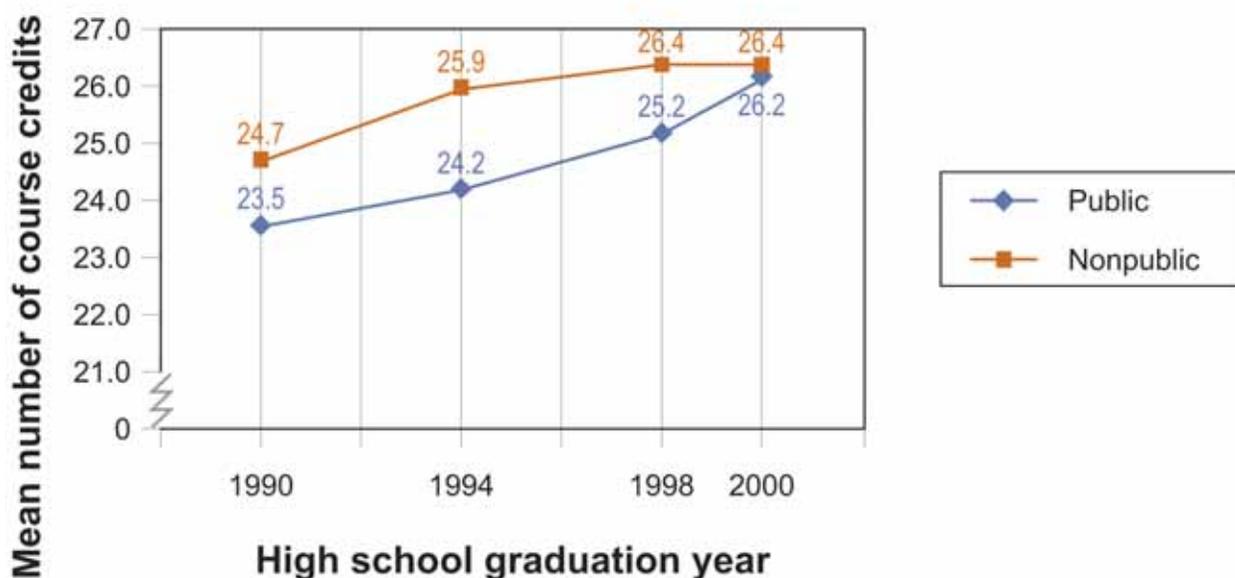


NOTE: "Course credits" refer to standardized Carnegie units.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

Total Course Credits Earned, by School Type. Figure 8 shows the mean number of course credits earned by high school graduates, by school type (public school vs. nonpublic school), for the years 1990, 1994, 1998, and 2000.

Figure 8. Mean course credits earned by high school graduates, by school type: 1990, 1994, 1998, and 2000



NOTE: "Course credits" refer to standardized Carnegie units. Nonpublic schools include Catholic schools, other religious schools, and all other private schools.

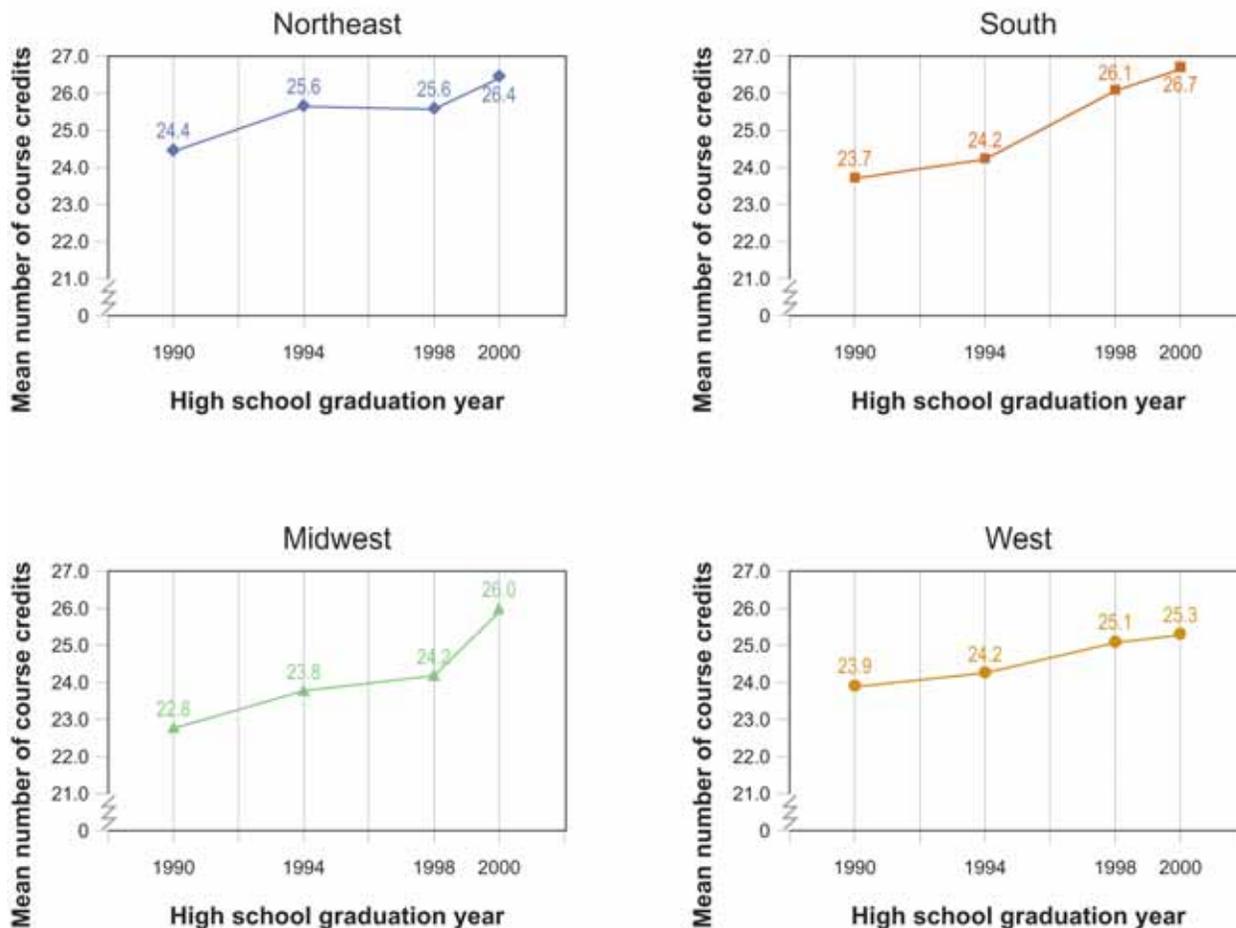
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

In both the 1990 and 1994 HSTS transcript studies, nonpublic high school graduates earned more course credits than public high school graduates. In the 1994 transcript study, for example, nonpublic high school graduates earned a mean 25.9 course credits, compared to the mean 24.2 course credits earned by public high school graduates. Such differences were not detected for either the 1998 or 2000 HSTS transcript studies.

Both public and nonpublic high school graduates increased their number of earned course credits from 1990 to 2000. The 2000 public school graduates earned a mean 26.2 course credits, compared with the mean 23.5 course credits earned by the 1990 public school graduates. The 2000 nonpublic school graduates earned a mean 26.4 course credits, compared with the mean 24.7 course credits earned by the 1990 nonpublic school graduates.

Total Course Credits Earned, by Region of the Country. Figure 9 shows the mean number of course credits earned by high school graduates, by region of the country, for the years 1990, 1994, 1998, and 2000.

Figure 9. Mean course credits earned by high school graduates, by region of the country: 1990, 1994, 1998, and 2000



NOTE: "Course credits" refer to standardized Carnegie units. "Region of the country" refers to Census-defined geographic regions.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, High School Transcript Study (HSTS), 2000, 1998, 1994, 1990.

High school graduates from the South and Northeast regions earned more course credits (mean 26.7 and 26.4 credits, respectively) in 2000 than high school graduates from the West region (mean 25.3 credits). All four regions of the country posted an increase in their high school graduates' mean course credits earned from 1990 to 2000. The Midwest region's graduates posted an increase of 3.2 credits in their mean course credits over the 10-year period, and the South region's graduates posted an increase of 3.0 credits. From 1990 to 2000, the Northeast region's high school graduates posted an

increase of 2.0 credits in their mean course credits, and the West region's graduates posted an increase of 1.4 credits.

Summary

The decade between 1990 and 2000 saw increases in the numbers of course credits earned by high school graduates. Each examined student and school subgroup—student gender, student race/ethnicity, school type, and region of the country—increased the number of course credits they earned. The number of core and non-core course credits also increased through the decade. Within the core academic courses, there was an increase in the percentage of students earning AP and IB mathematics courses from 1990 to 2000. There was an increase in the number of computer-related vocational course credits in that 10-year span, but there was also a decrease in the number of noncomputer-related vocational credits.